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Center-symmetric Landau gauge meets the lattice

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Content

A lattice implementation of the recently introduced center-symmetric Landau gauge is discussed and its predictions confronted with numerical Monte Carlo simulations. It is shown that the link average and the link correlators computed in that gauge are order parameters of the confinement-deconfinement transition at nonzero temperature. Strictly speaking, this requires a specific treatment of the Gribov copies that we discuss in detail. The numerical simulations comply with the theoretical predictions for the link average computed below and above the deconfinement temperature. Our results show that, within appropriately chosen gauges, one can construct local order parameters for center symmetry, as proxies for the nonlocal Polyakov loop.

Primary author(s) :   Prof. OLIVEIRA, Orlando (University of Coimbra); Dr. REINOSA, Urko (Ecole Polytechnique); Dr. SILVA, Paulo (Ucoimbra); Dr. TISSIER, Matthieu (Sorbonne, Paris); Dr. SERREAU, Julien (U Paris); Mrs. VAN EGMOND, Duifje (ICT)

Presenter(s) :   Mrs. VAN EGMOND, Duifje (ICT)